

REMARKS

This amendment is in response to a first Office action (Paper No. 3) dated August 22, 2002. Upon entry of this amendment, claims 1-28 will be pending in this application. Applicants have newly added claims 21-28 by this amendment.

The Examiner has objected to the figures and the specification for not illustrating and describing the claimed feature of the heater resistors disposed on the underside of the nozzle plate. Applicants have added a new Figure 4 illustrating this feature and a new paragraph to the specification describing this feature to overcome these objections.

The Examiner has objected to FIG. 1 for not having a legend *such as* "Prior Art". Applicants have amended FIG. 1 to now have a legend "Background Art". Applicants submit that FIG. 1 is not derived from a patent or a printed publication but, are instead, the work product of the Applicants. Therefore, Applicants submit that FIG. 1 is not prior art as per 35 U.S.C. § 102. Therefore, Applicants are now labeling FIG. 1 as "Background Art" instead of "Prior Art". Applicants kindly note that MPEP § 608.02 (g) does not mandate a labeling "Prior Art" as by the language "such as" in MPEP § 608.02 (g). Therefore, since 1) FIG. 1 is not taken from a patent or a printed publication but is the work product of the inventor and 2) since MPEP § 608.02 (g) indicates a legend *such as*, Applicants are now labeling FIG. 1 "Background Art".

The Examiner has rejected claims 1, 2, 4-9, 11-16 and 18-20 under 35 U.S.C. § 103 (a) as

being unpatentable over Silverbrook, U.S. Patent No. 5,841,452 in view of Mori, JP 05-131631. The Examiner has rejected claims 3, 10 and 17 under 35 U.S.C. § 103 (a) as being unpatentable over Silverbrook '452 in view of Mori '631, and further in view of Cielo *et al.*, U.S. Patent No. 4,164,745. Applicants traverse these rejections.

The Examiner relies heavily on Mori, JP 05-131631 to reject Applicants' claims but the Examiner does not furnish an English translation of Mori '631. Therefore, Applicants had Mori '631 translated and are hereby submitting an English translation of Mori '631 with this amendment to become part of the file wrapper for this application.

The Examiner relies on Silverbrook '452 to illustrate an ink jet printhead structure with an "hourglass" structure. The Examiner relies on Cielo '745 to illustrate the feature of an annular-shaped heater being disposed on either the top side or the bottom side of the nozzle plate. Applicants respectfully disagree. Silverbrook '452 pertains to a structure for a bubble ink-jet printhead. Applicant claims in claims 1, 7 and 12 that the heaters produce bubbles to eject ink from the chamber onto a sheet of recording media. However, Cielo '745 does not pertain to bubble-jet ink-jet printheads. Cielo '745 does not produce bubbles in the ink. Cielo '745 merely heats the ink to produce a change in the viscosity of the ink to produce a change in the line width printed. Therefore, Applicants submit that one having ordinary skill in the art would not turn to Cielo '745 to fill in for the deficiencies of a bubble type ink-jet printhead of Silverbrook '745. Furthermore, Applicants submit that if Silverbrook '745 were modified according to Cielo '745,

the result would no longer be a bubble type ink-jet printhead, as claimed by Applicants. Therefore, removal of the rejections of claims 3, 10 and 17 is respectfully requested.

Furthermore, Applicants can find no evidence that Cielo '745 teach an *annular* shaped heater.

The Examiner relies on Mori '745 to show a plurality of ink passages, each passage having a plurality of grooves for the purpose of smoothing the flow of ink. Applicants submit this is not what Applicants are claiming. Applicants claim in claims 1, 7 and 12 that the grooves are disposed along the passageway **between the ink reservoir to the chamber**. This passageway is through the substrate. In contradistinction, Mori '631 teaches grooves disposed in a passageway between the *chamber* (or ink ejection element) *and the orifice* 4. The chamber in Mori '631 is indicated by pit 6. In pit 6 is a heater used to generate bubbles in the ink to cause ink to be ejected through orifice 4. Along the passageway between the pit 6 and the orifice 4 are grooves 12 or 13. Applicants submit that this is not the same as having grooves disposed between the ink reservoir and the chamber. The flow of ink between the ink reservoir and the chamber is not controlled by bubbles pushing ink out of an orifice. Instead, the flow of ink in the passageway between the ink reservoir and the chamber is controlled by replacing ink in the chamber that has been ejected.

Furthermore, Mori '631 teaches that the grooves in the passageway between the chamber and the orifice is formed on a layer of a thick film organic structure 11 such as polyimide. In Applicants' invention, the grooves are not formed on any layer. This is because the grooves in Applicants' structure are formed on a passageway through the substrate, not on some thin layer. This, therefore complicates the production of the grooves in Applicants' structure compared to the producing of the grooves in Mori '631. Therefore, Applicants submit that Mori '631 fails to teach or fairly suggest the structure of Applicants' claims 1, 7, and 12. Removal of the prior art rejections is respectfully requested.

Applicants have newly added claims 21-28 by this amendment. These claims claim various combinations of the features of 1) the cross section of the ink inlet passages are circular, 2) that the grooves are formed over an entire surface of said inner wall, 3) that the grooves are oriented in a direction parallel to a direction going through the substrate or base plate, 4) that the printhead is a bubble type ink jet printhead, 5) and that the ink inlet passages extend through the base plate or substrate. Applicants submit that none of these 5 features is either taught or suggested by the applied prior art.

A fee of \$144 is incurred by the addition of eight (8) claims in excess of 20. Applicants' check drawn to the order of Commissioner accompanies this Response. Should the check become lost, be deficient in payment, or should other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicants' undersigned attorney in the amount of such fees.

A Letter to the Office Draftsman accompanies this Amendment for changes to FIGS. 1 and 2 and the addition of FIG. 4. Indication in subsequent Office correspondence as to the acceptance of the drawing corrections proposed in the Letter is respectfully requested to enable Applicants to timely arrange for the corrections to be made prior to the date for payment of any issue fee.

In view of the above, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Reconsideration of the rejections and objections is requested. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

Respectfully submitted,



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MARKED-UP VERSION OF AMENDMENTS

IN THE SPECIFICATION

Please amend paragraph [0011] as follows:

[0011] FIG. 2 is a sectional view illustrating the structure of an inkjet printhead according to the present invention[; and] where the heaters are on a top side of the nozzle plate;

Please amend paragraph [0012] as follows:

[0012] FIG. 3 is a perspective view illustrating a portion of the inkjet printhead shown in FIG. 2[.] ; and

FIG. 4 is a sectional view illustrating a structure of the inkjet printhead according to the present invention where the heaters are on the underside of the nozzle plate.

Please insert a paragraph as follows between paragraph [0015] and paragraph [0016]:

FIG. 4 illustrates a sectional view of the ink jet printhead according to another embodiment of the present invention where the heaters 140' and the electrodes 141' are on the underside of nozzle plate 110. In this embodiment, the heaters 140' can directly heat ink in chamber 130 to produce bubbles to eject ink through orifice 111.

IN THE CLAIMS

Please add claims 21 through 28, as listed above.